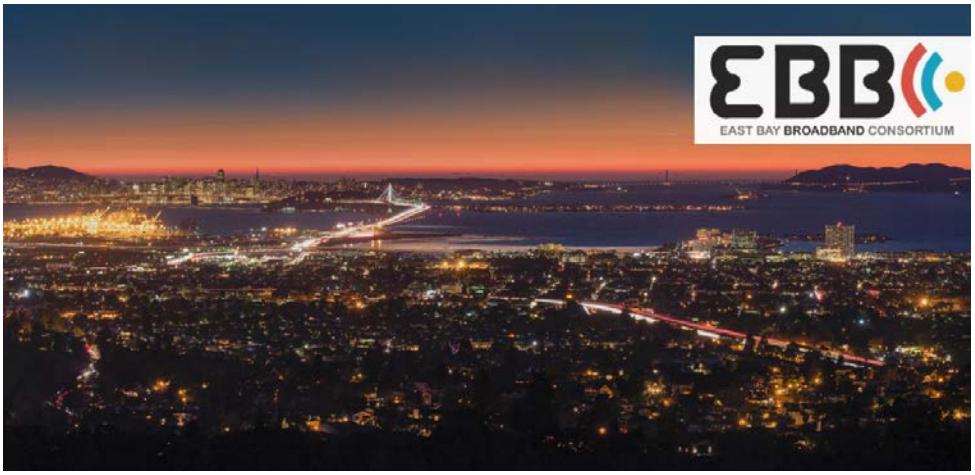

FASTER INTERNET FOR EVERYONE

A White Paper from the East Bay Broadband Consortium (EBBC)
Launching a Campaign to Make the East Bay a Gigabit Region

What is gigabit-speed broadband internet?
Why is it so important for us all to have gigabit broadband in the East Bay?
How we can work together to implement gigabit broadband throughout our region?

I. What Is Gigabit Broadband?

Gigabit broadband is a form of very high speed Internet which can provide data transfer download speeds of at least 1GB (gigabit) per second (Gbps). This download speed is the equivalent of 1000 MB (megabits) per second (Mbps). Most download speeds for current broadband connections are typically 8 to 12 Mbps or a bit higher, so gigabit broadband is close to 100 times faster.

"Everything we do online works much faster and much better with gigabit broadband."

This means finding, downloading and uploading much larger files and documents and much more data much faster, leading to: more, better, quicker medical information; much faster photo, video, and movie downloads, uploads, and streaming; much faster transfer of industrial and architectural design data; much more powerful games and game playing; quicker and more effective shopping; and on and on. Everything we do online works much faster and much better with gigabit broadband.

The term *gigabit* is used as a unit of measurement to determine the number of bits of data being transferred. A bit represents the smallest unit of data. One single character of text such as one letter of the alphabet takes up eight bits.

Many people confuse the term *gigabit* with the term *gigabyte*. The difference is that *gigabyte* refers to a unit of storage, such as 50GB of RAM (random access memory), whereas *gigabit* is used to define the rate of data transfer (upload or download) between two devices.

Gigabit broadband can utilize fiber optic lines, phone lines, copper wire, or wireless technology to deliver high speed Internet to homes, businesses, and public agencies. Currently, scores of cities in the United States offer gigabit broadband internet service.

Google has been an early catalyst for the emergence of gigabit broadband and is currently delivering gigabit broadband service to cities in Texas, Utah, and Kansas, and, with the acquisition of Webpass, some locations in California.

Comcast and AT&T are now providing gigabit broadband to a growing number of cities around the U.S. and both have announced plans to offer this service in the Bay Area sometime soon. Smaller providers, such as Sonic and PAXIO also offer gigabit broadband in selected portions of the East Bay.

The ultimate goal, as outlined by the Federal Communications Commission, is eventually to extend gigabit broadband throughout the United States. However, cities and regions that move to gigabit broadband first obtain strategic advantage.

II. Why Is Gigabit Broadband So Important?

Gigabit broadband, a much faster internet, should be a necessary component of any community's infrastructure and economic development planning. Typically, broadband and, now, gigabit broadband, is required to improve productivity, attract businesses, create jobs, and reduce costs in schools, healthcare institutions, public safety agencies, energy management, and other vital functions. Citizens and businesses throughout communities benefit by gaining access to new capabilities and new services.

"Gigabit broadband is essential infrastructure and should receive the same kind of attention as electric and gas lines, roads, bridges and airports."

Gigabit broadband internet is essential infrastructure and should receive the same kind of attention as electric and gas lines, roads, bridges, and airports. Ajit Pai, recently appointed Chairman of the Federal Communications Commission, made this point in a March 2017 speech, "If Congress moves forward with a major infrastructure package, broadband should be included."

In *Four Years of Broadband Growth*, the Obama White House report stated:

> "The build-out of broadband infrastructure itself is a major driver of American investment and job creation, but even more significant are the ways that connectivity is transforming a range of industries, from education to entertainment to agriculture to travel."

The term "Internet of Things," coined by Peter T. Lewis, covers a wide range of applications for gigabit broadband. He defined the Internet of Things as "the integration of people, processes and technology with connectable devices and sensors to enable remote monitoring, status, manipulation and evaluation…of such devices." The Internet of Things requires very fast gigabit speed.

This principle is being applied now as smart pretty much everything – smart schools, smart grid in energy, advanced manufacturing, smart infrastructure, smart agriculture, telehealth, smart transportation, smart homes, smart cars, smart retail, all incorporated in smart cities and smart regions.

According to Next Century Cities:

> "Across the country, communities recognize the importance of leveraging gigabit-speed internet to attract new businesses and create jobs, improve health care and education, and connect residents to new opportunities. Benefits range from new opportunities for small businesses, to higher property values, to a stronger local economy, to expanded citizen participation in government."

III. The Movement for Gigabit Broadband Around the Nation

The movement for gigabit broadband in the U.S. has taken a variety of forms. Here are some examples.

Chattanooga: In 2009, the Electric Power Board (EPB), the municipal energy utility in Chattanooga, Tennessee, launched its "smart grid" to provide highly efficient energy distribution with the ability to shift energy usage to avoid power outages. This provided EPB with the capability to offer gigabit broadband to all the 170,000 residents and businesses in Chattanooga by 2011.

Google: Google catalyzed the rapid widespread development of the movement for gigabit broadband in the U.S. when the company initiated a competition for cities to receive a build-out of gigabit fiber. The Kansas City metro region won that competition in 2012. Subsequently, Google has built fiber networks to provide gigabit-speed Internet in 7 other cities and metro regions including Atlanta, Austin, Nashville, the North Carolina Triangle region, Provo and Salt Lake City.

In October 2016, Google announced suspension of the Google Fiber program, which, combined with Google's acquisition of Webpass, has led to speculation that Google was shifting to an emphasis on wireless high-speed internet transmission.

Comcast: In February 2016, Comcast launched DOCSIS 3.1 (Digital Over Cable Service Interface Specification) to offer gigabit-speed broadband over its existing network. So far, Comcast has rolled out the program in Atlanta, Detroit and Nashville. In November 2016, Comcast announced expansion to Denver, Indianapolis, Jacksonville, Kansas City, Knoxville, Portland, the San Francisco Bay Area, San Jose, Salt Lake City and Seattle. The fact that Comcast uses its existing coaxial cable lines already piped into businesses and peoples' homes gives it an advantage over projects that must dig expensive trenches to lay fiber.

AT&T: As a condition for the merger with Direct TV, AT&T agreed to expand its gigabit broadband network, AT&T Fiber, to at least 12.5 million customers nationwide. In February 2017, AT&T announced that it was bringing fiber-to-the-home internet to five new metro areas, bringing its total to 51 metro areas in the U.S. This means that AT&T fiber is available to nearly 4 million homes and businesses out of its 15 million Internet subscribers. AT&T expects to reach its full 12.5 million customers in 67 metro areas by mid-2019.

"To date, 166 cities have joined Next Century Cities to obtain assistance in pursuing realization of the full power of high-speed, cost-effective, accessible broadband."

Next Century Cities: Next Century Cities has been formed as a collaborative association of cities to encourage gigabit broadband by demonstrating its value and celebrating its successes. To date, 166 cities have joined Next Century Cities to obtain assistance in pursuing realization of the full power of high-speed, cost-effective, accessible broadband.

IV. Gigabit Broadband in the East Bay

There is a patchwork of gigabit broadband availability and forms of access in the East Bay right now, with more on the way.

Comcast: At this point, Comcast has Business Internet 1 Gig and business ethernet (supporting 100 gigabit broadband) available to certain business parks and other business locations in the East Bay. Comcast has announced that, in 2017, it will be rolling out Gigabit Pro, a 2 gigabit fiber-based product that requires a professional installation and equipment designed for the most advanced digital homes. Comcast has also announced that it will ramp up consumer broadband speeds to 1 gigabit per second, using the DOCSIS system, throughout its Bay Area territory relatively early in 2017.

AT&T: In selected multi-tenant business locations, AT&T currently offers AT&T business fiber services in the East Bay, with high-speed Internet speeds up to 1 gigabit per second. AT&T also currently provides AT&T GigaPower fiber, with 1 gigabit per second speeds, to home locations in sections of Livermore, Dublin and San Ramon in the East Bay, and plans to expand to other parts of the East Bay between now and mid-2019.

Sonic: Sonic offers its gigabit fiber internet in some parts of the East Bay, in particular in the City of Brentwood through conduit installed as a requirement of the City for new developments. Sonic agreed to install fiber-optic cables throughout a large portion of Brentwood and, in return, the City agreed to maintain the conduit and lease the cables to Sonic. Sonic gives free internet to the Brentwood public schools if at least 30% of households in a school's jurisdiction become customers.

PAXIO: PAXIO provides gigabit broadband to some places in the East Bay, including portions of Emeryville and Oakland. PAXIO is building out an OpenFiber network in various cities, supporting Internet speeds up to 10 gigabits per second to serve businesses and residences alike. PAXIO uses this infrastructure for its own customers and leases it to other internet service providers.

"There is a patchwork of gigabit broadband availability and forms of access in the East Bay right now, with more on the way."

Lit San Leandro: Lit San Leandro is a public-private partnership that offers gigabit broadband to businesses through a fiber loop around downtown San Leandro. In this partnership, the City of San Leandro provides the underground conduit, San Leandro Dark Fiber owns the fiber optic cable that runs through the conduit, and Lit San Leandro owns and operates the switch and routing facilities that provide the services to businesses.

City of Vallejo/Inyo Networks: The City of Vallejo has established a public-private partnership with Inyo Networks. The City of Vallejo leases its fiber infrastructure, initially used to communicate between City departments, to Inyo Networks to market retail services to public agencies, educational institutions, medical facilities and businesses. The partnership includes a revenue sharing component, with 33% of gross receipts coming back to Vallejo to be reinvested into City infrastructure.

Webpass: Owned by Google Fiber, Webpass provides services at up to gigabit speed in Berkeley, Oakland and Emeryville by establishing partnerships with buildings that allow for the installation of wireless radios on the roofs of the buildings and ethernet ports in the various units. When customers sign up, the ethernet port in their unit is activated so they can plug in their router to receive broadband Internet.

V. Gigabit Broadband Policies

In moving from this patchwork of gigabit broadband to a "Gigabit Region," the cities and counties in the East Bay have many models and best practices to choose from in developing policies to encourage gigabit broadband in the East Bay. However, there are three key principles that should be lynch pins that all policies should embrace.

Three Principles: First, we all need to recognize that gigabit broadband constitutes essential infrastructure for all the residents, businesses, public agencies and neighborhoods in the East Bay. Just as the region needs well maintained roads and streets, sewers, airports, and the electric and natural gas grids, the region needs gigabit broadband serving everyone well.

Second, public agencies and internet service providers need to collaborate effectively to eliminate barriers and establish the broadband infrastructure the region needs.

Third, the region needs to work together to bridge the digital divide so that all residents and all neighborhoods, regardless of location, income level or ethnicity, have access to the internet and digital literacy leading to digital mastery.

"Key Principles…1) Gigabit broadband constitutes essential infrastructure... 2) Public agencies and internet service providers need to collaborate effectively... 3) The region needs to work together to bridge the digital divide."

Bridging the Digital Divide: In working for gigabit-speed broadband, it is essential to make sure that this does not make the gap between the digital haves and have-nots worse. To this end, in addition to improving broadband infrastructure in the East Bay, EBBC's other main initiative focuses on eliminating the digital divide.

In 2016 through the Digital Inclusion Solution, EBBC partnered with the Tech Exchange to provide more than 2,000 families with free computers, digital literacy training, tech support, and the opportunity to access low cost Internet. In addition, EBBC partners with the Tech Talent Pathways Partnership (T2P2) and other alliances, and co-founded the TechEquity Collaborative to work for a regional tech eco-system based on diversity, inclusion and equity.

As the region embraces gigabit-speed broadband, there are opportunities for everyone to contribute to bridging the digital divide, and EBBC will continue to assist in contributing to and coordinating among those efforts.

Models: The emergence of gigabit broadband in the East Bay is following one of two basic models, or a combination of the two:

1) Major telecom and internet service providers can build out gigabit broadband infrastructure privately, with varying degrees of cooperation from public agencies.

2) Public agencies can form public-private partnerships with providers to joint venture the establishment of gigabit broadband.

Most cities are following the first model, albeit often without substantial focused attention. However, Brentwood, San Leandro and Vallejo are taking the public-private partnership route to supplement the services offered by the major private providers.

Either route or a combination of both can work, if public agencies recognize the need for broadband infrastructure and establish effective strategies for obtaining it.

Best Practices: While cities and counties have little or no direct role in regulating internet service providers, local governments can play a vital role in ensuring that broadband projects address different communities' specific internet access needs and in determining whether the needs of residents, businesses and anchor institutions are being met.

There are a variety of best practices for public agencies to consider as they develop policies to encourage gigabit broadband. As examples, local governments can adopt policies that establish a jurisdiction's positive attitude toward broadband technology and the facilitation of capital investment by:

- Drafting a section of the municipal code or the general plan that addresses broadband infrastructure.
- Preparing land use and economic development plans that guide development and adopt ordinances that promote "smart" infrastructure and facilities.
- Reviewing permitting processes for broadband infrastructure installation to identify opportunities for streamlining, including the possibility of creating a master permit and inspection process for large scale broadband infrastructure projects.
- Establishing a "dig once" policy to ensure that public agencies install conduit whenever they excavate in the public right of way, for example, installing conduit underground as part of sewer main replacement.
- Requiring new developments, when they are being built, to include multi-channel conduit at a tiny fraction of the cost of excavation, and requiring third parties that do excavation work in the public right of way to provide public agencies with the opportunity to install conduit.
- Inventorying where fiber and conduit exist and establish mapping standards for public agency and third party projects so that public agencies and telecom companies can consider using existing routes.

Each jurisdiction can draw on these and other models and best practices to develop a uniquely appropriate strategy for encouraging gigabit broadband.

VI. Call to Action

To speed up the process of deploying gigabit broadband and bridging the digital divide throughout the East Bay, the East Bay Broadband Consortium is launching a campaign to encourage cities/towns and counties in the East Bay to adopt and implement a resolution to take the necessary steps to make the East Bay a "Gigabit Region."

MAKING THE EAST BAY A GIGABIT BROADBAND REGION

WHEREAS, high-speed Internet access – referred to generically as "broadband" and including wireline, fiber, and wireless technologies – is essential 21st Century infrastructure for economic competitiveness in a digital world and global economy;

WHEREAS, broadband infrastructure that supports gigabit speed downloading and uploading of data has become the emerging industry standard and is being deployed in various regions in the United States;

WHEREAS, the deployment and adoption of gigabit broadband is a major strategy to spur economic development by improving productivity, supporting new technology, attracting capital investment and generating jobs;

WHEREAS, the ability to be connected at gigabit speeds through the internet to information, services and digital tools is increasingly critical for access to and success in education, careers and economic opportunities;

WHEREAS, the East Bay is committed to helping families and children be healthy, productive, engaged and self–sufficient, realizing that the use of broadband can save both time and money for residents while helping them bridge the economic divide and improve their access to services and resources;

WHEREAS, broadband is a "green technology" that can significantly reduce impacts on the environment by offsetting vehicle trips, decreasing use of resources and saving energy;

WHEREAS, broadband can enable East Bay local governments to operate more efficiently and provide public services more broadly in a cost-effective manner; and

WHEREAS, local government can impact broadband deployment and adoption in its several roles and responsibilities, including as a policy leader, planning body, land use approval agency, purchaser-consumer of communications equipment and technology, and a service provider.

"We hereby aspire to become a "Gigabit Region" with gigabit-speed broadband available to residents, businesses, public agencies and nonprofit organizations."

THEREFORE, we hereby aspire to become a "Gigabit Region" with gigabit-speed broadband available to residents, businesses, public agencies and nonprofit organizations. We are committed to bridging the digital divide through strategies to provide universal access to and adoption of computers and high-speed Internet for families. We will assess internal processes and policies to streamline adoption and remove barriers to deployment and adoption of gigabit broadband. We will encourage and welcome telecom providers to deploy gigabit broadband and support their needs to expedite implementation.